

Safety Corner

What is Reliability Centred Maintenance?

Complex engineering systems require preventive maintenance as an assurance in meeting their functionalities and mission objectives. With maintenance costs going up over the years, operators and maintainers are constantly looking for means to conduct maintenance cost-effectively. Reliability Centred Maintenance (RCM) provides such means by offering an engineering framework that enables the complete maintenance regime of a physical asset to be defined based on the management of failures.

RCM is a method to identify the policies that should be implemented to manage failures to effectively and efficiently achieve the required safety, availability and economy of operations. Its goal is to avoid or reduce undesirable consequences but not necessarily to avoid failures. Through the identification of critical functions that are required to maintain the asset in a safe, serviceable and ready condition, and the failure mechanisms that can disable these functions, maintenance plans can be developed with a focus on preserving the required functions, rather than preserving equipment, in meeting mission objectives.

RCM is risk-based. The initial step of a typical RCM process is to understand a system's operating context and identify the failure modes and consequences (for example, by using a FMECA-Failure Mode Effects and Criticality Analysis). The second step is to apply the RCM logic to determine the appropriate maintenance tasks, to predict, prevent, or discover failures. A rationalised plan for task intervals and required resources is developed to prioritise tasks to preserve the critical functions of the system. Other logical actions, such as run-to-failure, condition monitoring, engineering redesigns, additional training, and changes/additions to operating procedures or technical manuals, can be included in the RCM regime. RCM should be well documented and considered as a continuing process where the effectiveness of the maintenance is kept under constant review and adjusted based on the experience gained.

The RCM concept has completely changed the way in which preventive maintenance is addressed. It is now widely recognised that allowing some non-critical items to run to failure instead of conducting preventive maintenance can be less costly but equally effective in assuring an acceptable level of operability and risk.

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